

## Dimensional Analysis - Practice Problems

1. How many cm are in 1 km? How many km are in 1 cm?

2. Convert 100 mL to gallons, given:

$$1 \text{ fl. oz.} = 29.57 \text{ mL}$$

$$1 \text{ cup} = 8 \text{ fl. oz.}$$

$$1 \text{ pint} = 2 \text{ cups}$$

$$1 \text{ quart} = 2 \text{ pints}$$

$$1 \text{ gallon} = 4 \text{ quarts}$$

3. The mass of a proton is  $1.67263 \times 10^{-24}$  g, and the mass of an electron is  $9.10939 \times 10^{-28}$  g. A molecule of  $\text{H}_2$  has two protons and two electrons. Find its mass.

4. In 2009, Usain Bolt ran the 100m dash in 9.58s. Find his average velocity in miles/hour. (You may find it useful to know that 1m = 39.37 inches, 1 foot = 12 inches, and 1 mile = 5,280 feet.)